Preparation And Characterization Of Composite Membranes

Esin Alkan, Sabriye Perçin, Esra Yavaşoğlu, Funda Şeker, Tuğba Sardohan
Suleyman Demirel University, Department of Chemistry, Isparta, Turkey

The polymer electrolyte membranes, also called as ion-exchange membranes, are interesting materials and have been used in various applications like fuel cells, super capacitors, sensors, chloro-alkali, electrodialysis, etc. In recent years, considerable amount of research have been carried out on the modification of ion-exchange membranes, due to their requirement with increased permselectivity for efficient removal of valuable ions from waste solution, removal of monolavent cation from mixed salt solution, removal of nitrate ions from ground water [1].

Among the conducting polymers, polyaniline, due to the ion-exchange and redox properties, has become important for separation science as membranes, supported films, and surface layers for applications ranging from gas separation and pervaporation to electrodialysis [2-3]. Separation properties of polyaniline can be tailored by nature of the dopant as well as by doping level of the polymer [4].

In this work, poly(2-chloroaniline) and poly(2-fluoroaniline) membranes were prepared by casting method. Poly(2-chloroaniline) and poly(2-fluoroaniline) were synthesized chemically using (NH₄)₂S₂O₈ as oxidant. Two different dopants (p-toluenesulfonate and 1,3 naphthalene trisulfonic acid) were used and the effect of dopant on the separation properties of polymers has been investigated. Ion-exchange capacity of composite membranes was determined by neutralization titration. The membranes were characterized by FT-IR, SEM and AFM.

References